NWS Portland Warning, Watch, Advisory Criteria

Guidance for all WWA Products:

Written instructions cannot address every operational situation. Protection of life and property takes precedence in decision making processes. As such, criteria for weather warnings are to be considered as guidance only, not strict thresholds. Forecasters may issue warnings and advisories based upon lower criteria if the event in question poses a significant threat to life.

Watch Issuance when confidence is ≥ 50%
Warning Issuance when confidence is ≥ 80%

Multi-Purpose Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Special Weather Statement	Duration: < 6 hours	- Strong, sub-severe **convection** or **gust fronts**. Could include gusts 40-57mph, hail < 1", frequent/continuous lightning. OR - Funnel clouds **not expected** to become a tornado threat (e.g. cold-core funnel clouds) OR - **Short term hazards** like frosty or icy conditions that may cause hazardous driving, but not meet freezing fog advisory criteria OR - Highlight a major **multi-hazard event** expected beyond 6 hours.

Convective Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Severe Weather Statement	Duration: 0-1 hour	Used to update, correct, expire, or cancel a TOR or SVR. An SVS should be issued at least once during the valid time of a SVR or TOR.
Severe Thunderstorm Watch	SPC-Driven	**Issued in coordination with Severe Prediction Center (SPC).** Observed and/or expected atmospheric conditions support the formation of severe thunderstorms.
Severe Thunderstorm Warning	Duration: 30-60 min	**Impact criteria:** Thunderstorms that are forecast to produce signifcant tree or structrual damage, downed powerlines, flying debris, or threaten lives/property. - Gusts **≥ 58 MPH** OR - Hail size **≥ 1”** OR - Damage reports that indicate thunderstorm wind or hail.
Tornado Watch	SPC-Driven	**Issued in coordination with SPC.** - When there is a forecast of multiple weak tornadoes or any tornado which could produce EF2 or greater damage. - The forecast event minimum thresholds should be at least 2 hours over an area at least 8,000 square miles.
Tornado Warning	Duration: 15-45 min	Radar indication or credible report of (developing) tornado, including TVS, hook echo, mesocyclone **TVS:** - gate to gate shear >90 kts within 30 nm of the RDA - gate to gate shear >70 kts between 30 to 55 nm of the RDA

Tornado Emergency	Duration: 15-45 min	Exceedingly rare situations when: Severe threat to human life and catastrophic damage from a tornado is imminent or ongoing. **Visual or radar sources confirm tornado. Radar imagery (e.g., debris ball signature) strongly suggests the existence of a damaging tornado.**
Special Marine Warning	Duration: 0-1 hour	**Wind:** Sustained wind or frequent gusts of ≥ 34 kt not adequately covered in CWF. Duration for up to 2 hours--usually less **Thunderstorm:** (Non-severe) a thunderstorm producing wind gusts of ≥ 34 kt that forms or moves over the marine forecast area **Severe Thunderstorm:** 50 kt wind gust, hail ≥ 3/4" diameter (penny-size) **Waterspout** indicated or observed

Hydrology Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Flood Potential Outlook	Lead Time: >36 hours	- Issued if expected hydro-meteorological conditions may cause flooding problems, generally a few days from the time of issuance as a "heads-up" to emergency managers and the public.
Flood Advisory	Lead Time: short term, generally 0 to 12 hours	- Issued for urban areas and/or small streams when hydro-meteorological conditions may cause flooding or smaller streams and urban areas (e.g. underpasses, low lying areas, or drainages) which may hinder or block public traffic or access
Flood Watch	Lead Time: 12-48 hours	- Issued when current or developing hydro-meteorological conditions indicate a threat of flooding, but the occurrence is neither certain or imminent
Flood Warning (River Forecast Points)	Lead Time: 6-24 hours	- Flooding at a river forecast point is imminent or in progress OR - River forecast indicates flooding within next several hours - Category of flooding increases (e.g. minor to moderate)
Flood Warning (Areal)	Lead Time: 6-24 hours	- Issued when flooding presents a threat to life or property
Flood Statement	--	- Used to update, correct, expire, or cancel a Flood Warning.
Flash Flood Watch	Lead Time: 6-48 hours	- Conditions indicate flash-flooding is possible but not imminent - Potential dam or levee failure
Flash Flood Warning	Lead Time: 0-6 hours	- Flash flooding is reported by a reliable source - Precipitation capable of producing flash flooding is detected or reported - Observed rainfall approaches or exceeds guidance obtained from the RFC - Sudden release from a dam, levee, or other structure due to controlled release or failure - Headwater tables or other predictive procedures indicate flash flooding - Notification by PacifiCorp that releases at Merwin Dam will be increased to 60,000 CFS or more within the next 6 hours
Flash Flood Statement	--	- Used to update, correct, expire, or cancel a Flash Flood Warning.

Flash Flood Emergency	Lead Time: 0-6 hours	FFW criteria **AND** one of the following: - State of Emergency declared due to life-threatening rapidly rising water - Flash flood water rises to level rarely ever seen or much higher than typical flash floods; - Multiple swift water rescue teams required; - Total failure of high hazard dam with catastrophic impacts.

Winter Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Winter Weather Advisory	Lead Time: 0-36 hours	**Cascades (above 2500'):** *6-11 inches in 12 hours* **Coast Range/Foothills and Upper Hood River Valley (elevations below 2500'):** *2-4 inches in 12 hours* **Western OR/WA Valleys/Coast/Gorge:** *1-3 inches in 12 hours* **Freezing rain:** *0.10-0.25" ice accumulation in 12 hours* **Impact Criteria:** *Significant travel inconveniences due to slippery roads and/or sidewalks, scattered power disruptions, significant civic or economic disruption (i.e. schools and/or businesses closed).*
Winter Storm Watch	Lead Time: 36-48 hours (can be longer for high-confidence events)	**≥ 50%** chance of a hazardous winter weather event meeting or exceeding warning and/or impact criteria
Winter Storm Warning	Lead Time: 0-36 hours	- Issued for all winter precipitation events meeting/exceeding warning guidelines and/or causing significant impact. ***Exceptions: Blizzards, Ice Storms, or Wind Chill are issued seperately.*** - Winter Storm Warnings include different event types such as heavy snow, snow mixed with sleet or freezing rain, blowing snow, etc. - If BOTH Winter Storm Warning and High Wind Warning criteria are met, issue both seperately: WSW for Winter Storm, and NPW for High Wind. Consider tying the two together in the *ADDITIONAL DETAILS...section of each. **Cascades (above 2500'):** *≥12 inches in 12 hours* **Coast Range/Foothills and Upper Hood River Valley (elevations below 2500'):** *≥4 inches in 12 hours* **Western OR/WA Valleys/Coast/Gorge (generally elevations below 1000'):** *≥3 inches in 12 hours OR ≥6" in 24 hours* **Impact Criteria:** *Life-threatening travel conditions, widespread power outages due to heavy snow, major economic disruption (i.e. closure of I-84).*

Snow Squall Warning	Duration: 30-60 min	Significant, short lived snow events causing extremely dangerous driving conditions from near white-out conditions
		
		- Snow accumulations are often **≤ 1"**
		- Added combination of:
		  - Gusty winds
		  - Sub-freezing ambient road temperatures
		  - Reduced visibility **(≤ 1/4 mi)**
		
		This would be a very rare event for our CWA

Ice Storm Warning	Lead Time: 0-36 hours	Significant, widespread and possibly damaging accumulations of ice: **≥0.25"** ice accumulation in **24 hours** **Impact Criteria:** *Widespread power outages due to downed ice-laden trees/limbs, life threatening travel conditions, major economic disruption (i.e. closure of I-84).*
Blizzard Warning	Lead Time: 0-36 hours	- Sustained wind speeds or frequent gusts of **35 mph** AND - Considerable falling and/or blowing snow frequently reducing visibility **<1/4 mile** for **3+ hours**
Wind Chill Advisory	Lead Time: 0-36 hours	- Wind chill is **≤ 0°F** AND - Expected to last **1+ hour** AND - Wind speed **≥ 10 mph** (see wind chill chart) For the Cascades, only consider wind chills at passes or below
Wind Chill Watch	Lead Time: 36-48 hours (can be longer for high-confidence events)	Conditions are favorable for hazardous wind chill to develop, but its occurrence, location, and/or timing is still uncertain
Wind Chill Warning	Lead Time: 0-36 hours	- Wind chill is **≤ -20°F** AND - Expected to last **1+ hour** AND - Wind speed **≥ 10 mph** (see wind chill chart) For the Cascades, only consider wind chills at passes or below

Non-Precip Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Wind Advisory	Lead Time: 12-36 hours	**Only issued for low-lying valleys between the Cascade foothills & Coast Range:** - ORZ006-007-008 (Willamette Valley) - ORZ005-WAZ022 (Lower Columbia in Columbia & Cowlitz Counties) - WAZ039 (Clark County) - **Sustained winds:** 30-39 mph (26-34 kt), duration of 1+ hour - **Frequent gusts:** 45-57 mph (39-49 kt), any duration
High Wind Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	Conditions are favorable for hazardous high wind conditions to develop, but its occurrence, location, and/or timing is still uncertain
High Wind Warning	Lead Time: 0-36 hours	**For all zones (except the Columbia River Gorge and Cascades):** - **Sustained winds:** 40 mph (40 kt), duration of 1+ hour - **Frequent gusts:** 58 mph (50 kt), any duration OR - Credible reports, or expectation, of widespread damaging wind at lower values **For the Columbia River Gorge and Cascades:** ORZ015-016 and WAZ045-046 (Western Columbia River Gorge) ORZ011-013 (North Oregon Cascades) WAZ019 (South Washington Cascades) - **Sustained winds:** 50 mph (43 kt), duration of 1+ hour - **Frequent gusts:** 75 mph (65 kt), any duration OR - Credible reports, or expectation, of widespread damaging wind at lower values

Heat Advisory	Lead Time: 12-36 hours	**Use WR Heat Risk Tool** - Heat Risk Value: 2.4-2.65 (**high orange**/**low red** levels) - Moderate risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Excessive Heat Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	Conditions are favorable for hazardous heat conditions to develop, but its occurrence, location, and/or timing is still uncertain
Excessive Heat Warning	Lead Time: 0-36 hours	**Use WR Heat Risk Tool** - Heat Risk Value: 2.66-3.9 (**red** level) - High risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration - Heat Risk Value: 4 (**magenta** level) - Rare, long duration heat event. Very high risk due to long duration heat with little to no relief overnight
Frost Advisory	Lead Time: 0-36 hours	**Growing Season Only (APR-OCT)** - Minimum shelter temperatures mainly **33°F-36°F** on nights with good radiational cooling conditions (light winds and clear skies) - Comprises of **all forecast zones except** for WAZ019, ORZ011, and ORZ013 (the High Cascades zones)
Freeze Watch	Lead Time: 48-96 hours	- Conditions are favorable for hazardous freeze conditions to develop, but its occurrence, location, and/or timing is still uncertain
Freeze Warning	Lead Time: 0-36 hours	**Growing Season Only (APR-OCT)** - Widespread minimum shelter temperatures between **29°F-32°F** - Comprises of **all forecast zones except** for WAZ019, ORZ011, and ORZ013 (the High Cascades zones)
Hard Freeze Watch	Lead Time: 48-96 hours	- Conditions are favorable for hazardous hard freeze conditions to develop, but its occurrence, location, and/or timing is still uncertain
Hard Freeze Warning	Lead Time: 0-36 hours	**Growing Season Only (APR-OCT)** - Widespread minimum shelter temperatures **≤28°F** - Comprises of **all forecast zones except** for WAZ019, ORZ011, and ORZ013 (the High Cascades zones)
Dust Advisory (polygon-based)	Lead Time: 12-36 hours	- Widespread or localized blowing dust reduces **visibilities to ≤ 1 mile, but > 1/4 mile** - Dust storms are extremely rare west of the Cascades
Dust Storm Warning (polygon-based)	Lead Time: 0-36 hours	- Widespread or localized blowing dust reduces **visibilities to ≤ 1/4 mile** - Sustained winds **≥ 25 mph** - Dust storms are extremely rare west of the Cascades
Blowing Dust Advisory (zone-based)	Lead Time: 12-36 hours	- Widespread or localized blowing dust reduces **visibilities to ≤ 1 mile, but > 1/4 mile** - Dust storms are extremely rare west of the Cascades
Blowing Dust Warning (zone-based)	Lead Time: 0-36 hours	- Widespread or localized blowing dust reduces **visibilities to ≤ 1/4 mile** - Sustained winds **≥ 25 mph** - Dust storms are extremely rare west of the Cascades
Dense Fog Advisory	Lead Time: 12-36 hours	- Widespread or localized fog is expected to, or is reducing visibilities **≤ 1/4 mile**

Freezing Fog Advisory	Lead Time: 12-36 hours	- Issue when we receive **multiple reports** from spotters, law enforcement, or other government agencies of hazardous conditions due to the freezing fog. ASOS reports of freezing fog, on their own, are not enough. - The freezing fog must affect a "representative part of the area".
Dense Smoke Advisory	Lead Time: 12-36 hours	- Widespread or localized smoke reduces visibility to **≤ 1/4 miles**

Coastal Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Beach Hazards Statement	--	High Sneaker Wave threat: - Swell height **≥ 9 ft** with a period **≥ 14 sec** on a weekend/holiday
Coastal Flood Advisory (for Tidal Overflow)	Lead Time: 0-36 hours	- Rivers at/near **80% flood flow** and tide + tidal anomaly of **9.5 ft** at Newport (South Beach) in the south and Astoria (Tongue Point) or Willapa Bay (Toke Point) in the north. OR - **Southwest Washington Coast:** Tide + tidal anomaly alone is **≥ 11 ft** at Willapa Bay (Toke Point, south Washington coast). - North **Oregon Coast:** Tide + tidal anomaly alone is **≥ 10.5 ft** at Astoria (Tongue point, north Oregon coast) or Garibaldi. - Central **Oregon Coast:** Tide + tidal anomaly alone is **≥ 12 ft** at Newport (South Beach, central Oregon coast). OR - Tidal flooding is **observed** and reported by a reliable source.
Coastal Flood Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	- See Coastal Flood Warning
Coastal Flood Warning	Lead Time: 0-36 hours (can be longer for high-confidence events)	- **Coastal Flood Index of ≥ 22** for a **.02 slope beach** is forecast or occurring. We will use .02 as a representative standard. OR - Tide + tidal anomaly alone is **14.5 ft or greater** at South Beach (central Oregon coast), Astoria (north Oregon coast), or Toke Point (south Washington coast).
High Surf Advisory	Lead Time: 0-36 hours	- Issued for swell energy flux of **100 x 10^4 J/ms**
High Surf Warning	Lead Time: 0-36 hours	- Issued for swell energy flux of **160 x 10^4 J/ms**

Marine Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Marine Weather Statement	Lead time: 0-36 hours	Product to provide mariners with details on significant or potentially hazardous conditions not otherwise covered in existing marine warnings and forecasts - **Non-Severe, Short-term Wind Events:** sustained winds or gusts to 33 kt are expected for 2 hours or less - **Non-Severe, Long-term Events:** dense fog, hazardous materials spills; volcanic impacts, trends for increasing and/or decreasing wind and wave/seas conditions - **Other hazardous events:** funnel clouds, tsunamis, marine debris, ice changes, freezing spray advisories, ashfall advisories

Special Marine Warning	Duration: 0-1 hour	**Wind:** Sustained wind or frequent gusts of ≥ 34 kt not adequately covered in CWF. Duration for up to 2 hours--usually less **Thunderstorm:** (Non-severe) a thunderstorm producing wind gusts of ≥ 34 kt that forms or moves over the marine forecast area **Severe Thunderstorm:** 50 kt wind gust, hail ≥ 3/4" diameter (penny-size) **Waterspout** indicated or observed
Dense Fog Advisory	Lead Time: 0-36 hours	- Widespread or localized fog reducing visibility to **< 1 nautical mile**
Dense Smoke Advisory	Lead Time: 0-36 hours	- Widespread or localized smoke reducing visibility to **< 1 nautical mile**
Small Craft Advisory	Lead Time: 0-36 hours	- Sustained wind speeds or frequent gusts of **21-33 kts** OR - Combined seas **≥ 10 ft** OR - Meets wave steepness criteria (local wave criteria below) OR - Seas **7-9 ft** with strong (**5.6 kts**) to very strong (**6.4 kts**) ebb currents (PZZ210 only) at Sand Island Tower station
Gale Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	- Conditions are favorable to meet Gale Warning criteria in the next 12-48 hours
Gale Warning	Lead Time: 0-36 hours	- Sustained winds or **frequent gusts of 34-47 kts**, either predicted or occurring
Storm Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	- Conditions are favorable to meet Storm Watch Warning criteria, but its occurrence, location, and/or timing is still uncertain
Storm Warning	Lead Time: 0-36 hours	- Sustained winds or **frequent gusts of 48-63 kts**, either predicted or occurring
Hurricane Force Wind Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	- Conditions are favorable to meet Hurricane Force Wind Warning criteria, but its occurrence, location, and/or timing is still uncertain
Hurricane Force Wind Warning	Lead Time: 0-36 hours	- Sustained winds or **frequent gusts of ≥ 64 kts**, either predicted or occurring, and not directly associated with a tropical cyclone
Hazardous Seas Watch	Lead Time: 12-48 hours (can be longer for high-confidence events)	- Conditions are favorable to meet Hazardous Seas Warning criteria, but its occurrence, location, and/or timing is still uncertain
Hazardous Seas Warning	Lead Time: 0-36 hours	- A warning for wave heights and/or wave steepness values meeting or exceeding locally defined warning criteria (see table below)

Local Wave Criteria

No Hazard (green) Small Craft Advisory (yellow) and Hazardous Seas (red)

-	-	Dominant Wave Period (seconds)						
-	-	<= 7	8	9	10	11	12	>= 13
Significant Wave Height (ft)	<=5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	>= 15							

Fire Weather Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Fire Weather Watch	Lead Time: 48-72 hours (can be longer for high-confidence events)	**1. Combination of strong wind and low humidity** - Daytime: RH ≤ 25% **AND** 10-minute wind speed 10 mph AND/OR gusts to ≥ 25 mph for 4 hours. - Night: RH ≤ 35% **AND** 10-minute wind speed of 15 mph AND/OR gusts to ≥ 30 mph for 3 hours. **2. Dry and unstable air mass** - Mid-6 and High level Haines 5/6, RH ≤ 25%, AND critical fuel conditions. For FWZ 607 & 608, there must be an active large fire (Type 1 or 2). **3. Lightning** - Scattered thunderstorm coverage, critical fuels AND no appreciable change in fuel conditions after the event.
Red Flag Warning	Lead Time: 24-60 hours (can be longer for high-confidence events)	**1. Combination of strong wind and low humidity** - Daytime: RH ≤ 25% **AND** 10-minute wind speed 10 mph AND/OR gusts to ≥ 25 mph for 4 hours. - Night: RH ≤ 35% **AND** 10-minute wind speed of 15 mph AND/OR gusts to ≥ 30 mph for 3 hours. **2. Dry and unstable air mass** - Mid-6 and High level Haines 5/6, RH ≤ 25%, AND critical fuel conditions. For FWZ 607 & 608, there must be an active large fire (Type 1 or 2). **3. Lightning** - Scattered thunderstorm coverage, critical fuels AND no appreciable change in fuel conditions after the event.

Geohazard Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Tsunami Advisory	NTWC-Driven	- Issued for the threat of a potential tsunami that may produce strong currents in harbors and bays or waves dangerous to those near the water. - Issued for sub-warning events **NOT** expected to produce wave amplitudes ≥ 1 meter
Tsunami Watch	NTWC-Driven	- Issued to alert the public of a tsunami event that may later impact the watch area - **Earthquake magnitude > 7.8:** the watch area will be for locations along the coast with wave arrival times 3-6 hours of the epicenter - No watches issued for earthquake magnitudes < 7.8
Tsunami Warning	NTWC-Driven	- Issued when a potential tsunami with significant widespread inundation is imminent or expected **- Earthquake magnitude 7.1 to 7.5:** the warning will be for an area 250 km from the epicenter, extending to the nearest breakpoint (e.g. Cascade Head) **- Earthquake magnitudes 7.5 to 7.8 (inclusive):** the warning area will be for an area 500 km from the epicenter, extending to the nearest breakpoint **- Earthquake magnitudes > 7.8:** the warning will be for locations along the coast with wave arrival times within 3 hours of the epicenter. Wave amplitudes are expected to be ≥ 1 meter
Ashfall Advisory (Land)	Coordination with VAAC & CVO	**- Coordination with Volcanic Ash Advisory Center (VAAC) and USGS Cascades Volcano Observatory (CVO) required** - Issued for a volcano undergoing a minor eruption where the public will be affected by a limited hazard extent such as <1/4" of ashfall accumulation

Ashfall Warning (Land)	Coordination with VAAC & CVO	**- Coordination with Volcanic Ash Advisory Center (VAAC) and USGS Cascades Volcano Observatory (CVO) required** - Issued for a volcano undergoing a major eruption where the public will be affected to a significant extent, such as ≥1/4" of ashfall accumulation, significant debris, lava or lahar flows.
Ashfall Advisory (Marine)	Coordination with VAAC & CVO	**- Coordination with Volcanic Ash Advisory Center (VAAC) and USGS Cascades Volcano Observatory (CVO) required** <1/4" of ashfall accumulation, pumice rafts, or some floating debris.
Ashfall Warning (Marine)	Coordination with VAAC & CVO	**- Coordination with Volcanic Ash Advisory Center (VAAC) and USGS Cascades Volcano Observatory (CVO) required** ≥1/4" of ashfall accumulation, significant debris, lava, or lahar flows.

3rd Party Hazard	Lead Time / Duration Guidance	Criteria (including IMPACTS)
Air Stagnation Advisory	Lead Time: Up to 36 hours	- Persistent surface **inversions** (especially sharp ones) - NW Oregon and SW Washington **mixing level <2000 ft** - Transport winds **<5 kts** - **No precipitation** expected - Above conditions to last **48+ hours**
Air Quality Alert	Partner-Driven	Requested by Department of Environmental Quality (DEQ) or Lane Regional Air Protection Agency (LRAPA)
Special Avalanche Bulletin	Partner-Driven	Requested by Northwest Avalanche Center (NWAC)
Avalanche Watch	Partner-Driven	Requested by Northwest Avalanche Center (NWAC)
Avalanche Warning	Partner-Driven	Requested by Northwest Avalanche Center (NWAC)